



Chartered Quality Institute

CQI Examinations January 2016

## Unit 303

### Monitoring and Measuring for Quality (Level 3)

21 January 2016

Time: 9.40 – 12.10  
(2½ hours)

#### Notes for candidates

At 9.30, you have 10 minutes preparation time before the exam begins.  
Your exam booklet will be handed out at 9.40.

Attempt **ALL THREE questions** in **Section A**. Attempt **any TWO** questions from **Section B**.  
If you attempt three or more questions in Section B, only the first two will be marked.

Questions may be attempted in any order. All questions carry equal marks.  
The maximum marks for each part of each question are shown.

Begin each question at the top of a fresh side of paper.  
Do not write in the margins.

If you use any additional sheets (graph paper or additional answer booklet) please  
write your CQI student number, examination name and date on each sheet.

## SECTION A – ANSWER ALL QUESTIONS

### QUESTION 1

The voice of the customer and the voice of the process are key sources of information to enable effective decisions and support the objective of continual improvement.

- (a) Describe the quality principle ‘factual approach to decision making’ and how this impacts a quality management system. **(5 marks)**
- (b) Explain what is meant by the ‘voice of the customer’ and the ‘voice of the process’. **(6 marks)**
- (c) Identify and briefly describe **three** methods of collecting information or data to understand the ‘voice of the customer’. **(9 marks)**

### QUESTION 2

Acceptance sampling is a tool used by many organisations to assess product or service quality levels.

- (a) Explain **two** advantages of using sampling to assess product or service quality levels. **(6 marks)**
- (b) Explain what an acceptance sampling plan is, your explanation should include descriptions of the following terms:
- Acceptable quality level
  - Reject quality level
  - Producer’s risk (Alpha risk)
  - Consumer’s risk (Beta risk)
  - Sample size
  - Acceptance number.

**(14 marks)**

### QUESTION 3

Feigenbaum wrote that no two manufactured pieces are ever made exactly alike, this is also true for the provision of services.

- (a) Identify and briefly explain **three** classifications of variation in products or services that are useful for analytical purposes. **(6 marks)**
- (b) List **four** typical generic headings that can be used to group more specific sources of variation to help with analysis. **(4 marks)**
- (c) Explain the terms ‘common cause variation’ and ‘special cause variation’ and identify and explain **one** example for each cause. **(10 marks)**

**(10 marks)**

## SECTION B – ANSWER TWO QUESTIONS ONLY

### QUESTION 4

Statistical methods are key to modelling and understanding data. The data (shown below) has been collected from a process that has already been shown to be stable.

31, 43, 37, 34, 39, 35, 39, 34, 37, 35, 41, 39, 33, 41, 39

(a) Briefly explain **one** benefit of using statistical modelling techniques to model data.

(3 marks)

(b) Showing all of your workings in a tabulated form, calculate the standard deviation for the data shown above to two decimal places.

(17 marks)

### QUESTION 5

Collection of data can be a complex and costly exercise. Sampling is one technique used to minimise the costs of data collection.

(a) Excluding acceptance sampling, list **four** other data collection methods.

(4 marks)

(b) From the list of data collection methods that you have identified in (a), describe, in detail, **two** of the methods.

(10 marks)

(c) List and briefly explain **three** circumstances where you would not use acceptance sample inspection to control a product or process.

(6 marks)

### QUESTION 6

The selection of data collection methods is critical when setting up or modifying a process.

(a) Describe a systematic approach you could use to develop effective data collection methods to control a new process you are implementing.

(16 marks)

(b) Briefly describe **two** circumstances when data collection should be conducted away from the process.

(4 marks)

### QUESTION 7

The use of cameras to collect inspection information has become very common and can provide attribute, variable and subjective inspection data.

(a) Describe **one** benefit and **one** disadvantage of using cameras to collect inspection data.

(4 marks)

(b) Explain the terms attribute and variable data, ensure that your answer includes:

- A description of both attribute and variable data
- How each type of data is collected
- The differences between the two types of data
- **One** example of variable data and **one** example of attribute data.

(10 marks)

(c) Explain what is meant by subjective inspection data and describe **one** example of subjective assessment, including how this can be classified and recorded.

(6 marks)

